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1 READING & WRITING: FILL IN THE BLANKS

1.1 MT. EVEREST

Called Chomolungma ("goddess mother of the world") in Tibet and Sagarmatha ("goddess of the sky") in Nepal, Mount Everest once went by the pedestrian name of Peak XV among Westerners. That was before surveyors established that it was the highest mountain on Earth, a fact that came as something of a surprise—Peak XV had seemed lost in the crowd of other formidable Himalayan peaks, many of which gave the illusion of greater height.

In 1852 the Great Trigonometrical Survey of India measured Everest's elevation as 29,002 feet above sea level. This figure remained the officially accepted height for more than one hundred years. In 1955 it was adjusted by a mere 26 feet to 29,028 (8,848 m).

The mountain received its official name in 1865 in honor of Sir George Everest, the British Surveyor General from 1830—1843 who had mapped the Indian subcontinent. He had some reservations about having his name bestowed on the peak, arguing that the mountain should retain its local appellation, the standard policy of geographical societies.

Before the Survey of India, a number of other mountains ranked supreme in the eyes of the world. In the seventeenth and eighteenth centuries, the Andean peak Chimborazo was considered the highest. At a relatively unremarkable 20,561 feet (6,310 m), it is in fact nowhere near the highest, surpassed by about thirty other Andean peaks and several dozen in the Himalayas. In 1809, the Himalayan peak Dhaulagiri (26,810 ft.; 8,172 m) was declared the ultimate, only to be shunted aside in 1840 by Kanchenjunga (28,208 ft.; 8,598 m), which today ranks third. Everest's status has been unrivaled for the last century-and-a-half, but not without a few threats.

Incorrect Options:

Surveyors = purveyors/surveillance/persuasion

Illusion = inclusion/allusion/anticipation

Accepted = excepted/incepted/intercepted

Reservations = applications/implications/rejections

Surpassed = reduces/surmises/transposed

1.2 LANGUAGE

If after years of Spanish classes, some people still find it impossible to understand some native speakers, they should not worry. This does not necessarily mean the lessons were wasted. Millions of Spanish speakers use neither standard Latin American Spanish nor Castilian, which predominate in U.S. schools.

The confusion is partly political—the Spanish-speaking world is very diverse. Spanish is the language of 19 separate countries and Puerto Rico. This means that there is no one standard dialect.

The most common Spanish dialect taught in the U.S. is standard Latin American. It is sometimes called "Highland" Spanish since it is generally spoken in the mountainous areas of Latin America.

While each country retains its own accents and has some unique vocabulary, residents of countries such as Mexico, Colombia, Peru, and Bolivia generally speak Latin American Spanish, especially in urban centers. This dialect is noted for its pronunciation of each letter and its strong "r" sounds. This Spanish was spoken in Spain in the sixteenth and seventeenth centuries, and was brought to the Americas by the early colonists.

However, the Spanish of Madrid and of northern Spain, called Castilian, developed characteristics that never reached the New World. These include the pronunciation of "ci" and "ce" as "th." In Madrid, "gracias" (thank you) becomes "gratheas" (as opposed to "gras-see-as" in Latin America.) Another difference is the use of the word "vosotros" (you all, or you guys) as the informal form of "ustedes" in Spain. Castilian sounds to Latin Americans much like British English sounds to U.S. residents.

Incorrect Options

Necessarily = usually/only/particularly

Mountainous = rocky/hidden/coastal

Accents = thoughts/infections/authority

Pronunciation = collection/remembering/elucidation

Problems = normalities/problems/distinguishes

1.3 TALL BUILDINGS

The Eiffel Tower was the tallest building in the world when it was completed in 1889. It was built for the World's Fair to demonstrate that iron could be as strong as stone while being infinitely lighter. And in fact the wrought-iron tower is twice as tall as the masonry Washington Monument and yet it weighs 70,000 tons less! It is repainted every seven years with 50 tons of dark brown paint.

Called "the father of the skyscraper," the Home Insurance Building, constructed in Chicago in 1885 (and demolished in 1931), was 138 feet tall and 10 stories. It was the first building to effectively employ a supporting skeleton of steel beams and columns, allowing it to have many more windows than traditional masonry structures. But this new construction method made people worry that the building would fall down, leading the city to halt construction until they could investigate the structure's safety.

In 1929, auto tycoon Walter Chrysler took part in an intense race with the Bank of Manhattan Trust Company to build the world's tallest skyscraper. Just when it looked like the bank had captured the coveted title, workers at the Chrysler Building jacked a thin spire hidden inside the building through the top of the roof to win the contest (subsequently losing the title four months later to the Empire State Building). Chrysler also decorated his building to mirror his cars, with hubcaps, mudguards, and hood ornaments.

Incorrect Options

Demonstrate = implicate/suggest/insinuate

Constructed = renovated/devised/invented

Skeleton = engine/ceiling/concrete

Investigate = exonerate/ameliorate/consecrate

Coveted = meaningless/royal/informal

1.4 UNITED NATIONS

Founded after World War II by 51 "peace-loving states" combined to oppose future aggression, the UN now counts 193 member nations, including its newest members, Nauru, Kiribati, and Tonga in 1999, Tuvalu and Yugoslavia in 2000, Switzerland and East Timor in 2002, Montenegro in 2006, and South Sudan in 2011.

United Nations Day has been observed on October 24 since 1948 and celebrates the objectives and accomplishments of the organization, which was established on October 24, 1945.

The UN engages in peacekeeping and humanitarian missions across the globe. Though some say its influence has declined in recent decades, the United Nations still plays a tremendous role in world politics. In 2001 the United Nations and Kofi Annan, then secretary-general of the UN, won the Nobel Peace Prize "for their work for a better organized and more peaceful world."

Since 1948 there have been 63 UN peacekeeping operations; 16 are currently under way. Thus far, close to 130 nations have contributed personnel at various times; 119 are currently providing peacekeepers. As of 31 August 2008, there were 16 peacekeeping operations underway with a total of 88,230 personnel. The small island nation of Fiji has taken part in virtually every UN peacekeeping operation, as has Canada.

Incorrect Options:

Including = especially/possibly/limiting

Observed = watched/monitored/examined

Engages = connects/absorbs/appoints

Influence = meaningless/consequences/descriptiveness

Operations = transgressions/processes/businesses

1.5 C.S. Lewis

C. S. Lewis, or Jack Lewis, as he preferred to be called, was born in Belfast, Ireland (now Northern Ireland) on November 29, 1898. He was the second son of Albert Lewis, a lawyer, and Flora Hamilton Lewis. His older brother, Warren Hamilton Lewis, who was known as Warnie, had been born three years earlier in 1895.

Lewis's early childhood was relatively happy and carefree. In those days Northern Ireland was not yet plagued by bitter civil strife, and the Lewises were comfortably off. The family home, called Little Lea, was a large, gabled house with dark, narrow passages and an overgrown garden, which Warnie and Jack played in and explored together. There was also a library that was crammed with books—two of Jack's favorites were Treasure Island by Robert Louis Stevenson and The Secret Garden by Frances Hodgson Burnett.

This somewhat idyllic boyhood came to an end for Lewis when his mother became ill and died of cancer in 1908. Barely a month after her death the two boys were sent away from home to go to boarding school in England.

Lewis hated the school, with its strict rules and hard, unsympathetic headmaster, and he missed Belfast terribly. Fortunately for him, the school closed in 1910, and he was able to return to Ireland.

After a year, however, he was sent back to England to study. This time, the experience proved to be mostly positive. As a teenager, Lewis learned to love poetry, especially the works of Virgil and Homer. He also developed an interest in modern languages, mastering French, German, and Italian.

Incorrect Options

Earlier = ago/previously/subsequently

Plagued = bothered/pestered/doubted

Explored = watched/inspired/investigated

Unsympathetic = careless/desensitized/deliberative

Experience = essence/understanding/suffering

1.6 ESTEE LAUDER

Leonard Lauder, chief executive of the company his mother founded, says she always thought she "was growing a nice little business." And that it is. A little business that controls 45% of the cosmetics market in U.S. department stores. A little business that sells in 118 countries and last year grew to be $3.6 billion big in sales. The Lauder family's shares are worth more than $6 billion.

But early on, there wasn't a burgeoning business, there weren't houses in New York, Palm Beach, Fla., or the south of France. It is said that at one point there was one person to answer the telephones who changed her voice to become the shipping or billing department as needed. You more or less know the Estée Lauder story because it's a chapter from the book of American business folklore. In short, Josephine Esther Mentzer, daughter of immigrants, lived above her father's hardware store in Corona, a section of Queens in New York City. She started her enterprise by selling skin creams concocted by her uncle, a chemist, in beauty shops, beach clubs and resorts.

No doubt the potions were good — Estée Lauder was a quality fanatic — but the saleslady was better. Much better. And she simply outworked everyone else in the cosmetics industry. She stalked the bosses of New York City department stores until she got some counter space at Saks Fifth Avenue in 1948. And once in that space, she utilized a personal selling approach that proved as potent as the promise of her skin regimens and perfumes.

1.7 FOREIGN STUDENTS' ENGLISH STANDARDS

Federal Education Minister Julie Bishop says she has seen no evidence that foreign students are graduating from Australian universities with poor English skills.

Research by Monash University academic Bob Birrell has found a third of foreign students are graduating without a competent level of English. But Ms. Bishop says Australian universities only enroll foreign students once they have achieved international standards of language proficiency. "This has been an extraordinary attack by Professor Birrell on our universities," she said. "International students must meet international benchmarks in English language in order to get a place at a university in Australia and they can't get into university without reaching that international standard."

University of Canberra vice chancellor Roger Dean also says international students are required to sit an English test before being admitted to nearly all Australian universities. "There are, of course, intercultural difficulties as well as language difficulties," he said. "There are, of course, also many Australian students who don't speak such fantastically good English either. So we're trying to push the standard even higher than present but it's a very useful one already."

Ms Bishop says Australia's university system has high standards. "I've seen no evidence to suggest that students are not able to complete their courses because they're failing in English yet they're being passed by the universities," she said. "I've not seen any evidence to back that up. International education is one of our largest exports, it's our fourth largest export and it's in the interest of our universities to maintain very high standards because their reputation is at stake."

1.8 WALTZED IN FROM THE RUMBLING

Plants & Animals are a Montreal-based indie rock trio that began playing together as kids. Touring arduously for about five years after their proper full-length debut in 2008, they pretty much made their records on the go until 2013. So the band's decision to be slow, deliberate, and thorough on their latest offering, *Waltzed In From The Rumbling*, represents a major change of pace. Finally sleeping in their in own beds while recording, the band assembled the album over the course of nine seasons. It's a return to their origins, but it also pushes audaciously forward.

The aesthetic varies wildly and wonderfully from track to track, each song having its own hermetic seal but somehow still melding cohesively as a body of work. Jangling guitars, drums leaning toward the off-kilter swing of J Dilla, found sounds, a hint of shoegaze, and unorthodox instrumentation come together to keep the ear constantly engaged with a feeling of constant evolution. They found an antique guiro next to a broken VCR and recorded both. They made an empty fridge sound like a timpani drum. They recorded gossip on a city bus. They brought in classical string flourishes. They sometimes left mistakes if they felt they were perfectly imperfect. It's truly DIY, but with a feel of big production value that makes the album soar.

Contemplative lyrics anchor the album through all the exploratory wandering. The words are delivered melodically, belying their potency, but listening beyond the pretty aesthetic reveals piercing observations and an undeniable translation of feeling. The simplicity of the penetrating refrain on the three-part mini opus "Je Voulais Te Dire" is a paragon of how the lyrics effortlessly cut through the instumentation. Guitarist/vocalist Warren Spicer sings "It's only love, but you want it bad," encompassing how we try to avoid and downplay our desire for love and affection, but ultimately search and long for it anyway.

1.9 BLACK DIAMONDS

An exotic type of diamond may have come to Earth from outer space, scientists say. Called carbonado or "black" diamonds, the mysterious stones are found in Brazil and the Central African Republic. They are unusual for being the color of charcoal and full of frothy bubbles. The diamonds, which can weigh in at more than 3,600 carats, can also have a face that looks like melted glass.

Because of their odd appearance, the diamonds are unsuitable as gemstones. But they do have industrial applications and were used in the drill bits that helped dig the Panama Canal. Now a team led by Stephen Haggerty of Florida International University in Miami has presented a new study suggesting that the odd stones were brought to Earth by an asteroid billions of years ago. The findings were published online in the journal Astrophysical Journal Letters on December 20.

The scientists exposed polished pieces of carbonado to extremely intense infrared light. The test revealed the presence of many hydrogen-carbon bonds, indicating that the diamonds probably formed in a hydrogen-rich environment—such as that found in space.

The diamonds also showed strong similarities to tiny nanodiamonds, which are frequently found in meteorites. "They're not identical," Haggerty said, "but they're very similar." Astrophysicists, he added, have developed theories predicting that nanodiamonds form easily in the titanic stellar explosions called supernovas, which scatter debris through interstellar space.

The deposits in the Central African Republic and Brazil, he said, probably come from the impact of a diamond-rich asteroid billions of years ago, when South America and Africa were joined. So even though the two diamond fields are now thousands of miles apart, they're remnants of a single, original deposit. Haggerty estimated that the asteroid must have been about half a mile (one kilometer) in diameter.

1.10 Advertising a Global Perspective

Drive down any highway, and you'll see a proliferation of chain restaurants—most likely, if you travel long and far enough, you'll see McDonald's golden arches as well as signs for Burger King, Hardee's, and Wendy's, the "big four" of burgers. Despite its name, though, Burger King has fallen short of claiming the burger crown, unable to surpass market leader McDonald's No. 1 sales status. Always the bridesmaid and never the bride, Burger King remains No. 2.

Worse yet, Burger King has experienced a six-year 22 percent decline in customer traffic, with its overall quality rating dropping while ratings for the other three contenders have increased.1 The decline has been attributed to inconsistent product quality and poor customer service. Although the chain tends to throw advertising dollars at the problem, an understanding of Integrated Marketing Communication theory would suggest that internal management problems (nineteen CEOs in fifty years) need to be rectified before a unified, long-term strategy can be put in place.

The importance of consistency in brand image and messages, at all levels of communication, has become a basic tenet of IMC theory and practice. The person who takes the customer's order must communicate the same message as Burger King's famous tagline, "Have it your way," or the customer will just buzz up the highway to a chain restaurant that seems more consistent and, therefore, more reliable.

1.11 Vegetarian Market

Mintel Consumer Intelligence estimates the 2002 market for vegetarian foods, those that directly replace meat or other animal products, to be $1.5 billion. Note that this excludes traditional vegetarian foods such as produce, pasta, and rice. Mintel forecasts the market to nearly double by 2006 to $2.8 billion, with the highest growth coming from soymilk, especially refrigerated brands.

The Food and Drug Administration's 1999 decision to allow manufacturers to include heart-healthy claims on foods that deliver at least 6.25 grams of soy protein per serving and are also low in saturated fat and cholesterol has spurred tremendous interest in soymilk and other soy foods. A representative of manufacturer Food Tech International (Veggie Patch brand) reported that from 1998 to 1999, the percentage of consumers willing to try soy products jumped from 32% to 67%. Beliefs about soy's effectiveness in reducing the symptoms of menopause also attracted new consumers. A 2000 survey conducted by the United Soybean Board showed that the number of people eating soy products once a week or more was up to 27%. Forty-five percent of respondents had tried tofu, 41% had sampled veggie burgers, and 25% had experience with soymilk (Soyfoods USA e-mail newsletter). Mintel estimates 2001 sales of frozen and refrigerated meat alternatives in food stores at nearly $300 million, with soymilk sales nearing $250 million.

1.12 Drinking in Bronze Age

By the Bronze Age drinking vessels were being made of sheet metal, primarily bronze or gold. However, the peak of feasting - and in particular, of the 'political' type of feast - came in the late Hallstatt period (about 600-450 BC), soon after the foundation of the Greek colony of Massalia (Marseille) at the mouth of the Rhine. From that date on, the blood of the grape began to make its way north and east along major river systems together with imported metal and ceramic drinking vessels from the Greek world.

Wine was thus added to the list of mood-altering beverages - such as mead and ale (see coloured text below) - available to establish social networks in Iron Age Europe. Attic pottery fragments found at hillforts such as Heuneburg in Germany and luxury goods such as the monumental 5th century Greek bronze krater (or wine mixing vessel) found at Vix in Burgundy supply archaeological evidence of this interaction. Organic containers such as leather or wooden wine barrels may also have travelled north into Europe but have not survived. It is unknown what goods were traded in return, but they may have included salted meat, hides, timber, amber and slaves.

1.13 Just in Time

`Just-in-time' is a management philosophy and not a technique. It originally referred to the production of goods to meet customer demand exactly, in time, quality and quantity, whether the `customer' is the final purchaser of the product or another process further along the production line. It has now come to mean producing with minimum waste. "Waste" is taken in its most general sense and includes time and resources as well as materials.

1.14 William Shakespeare

For all his fame and celebration, William Shakespeare remains a mysterious figure with regards to personal history. There are just two primary sources for information on the Bard: his works, and various legal and church documents that have survived from Elizabethan times. Naturally, there are many gaps in this body of information, which tells us little about Shakespeare the man.

William Shakespeare was born in Stratford-upon-Avon, allegedly on April 23, 1564. Church records from Holy Trinity Church indicate that he was baptized there on April 26, 1564. Young William was born of John Shakespeare, a glover and leather merchant, and Mary Arden, a landed local heiress. William, according to the church register, was the third of eight children in the Shakespeare household—three of whom died in childhood. John Shakespeare had a remarkable run of success as a merchant, alderman, and high bailiff of Stratford, during William's early childhood. His fortunes declined, however, in the late 1570s.

1.15 US Business Schools

Top US business schools are recruiting younger, less experienced candidates in an effort to boost applications and head off competition for the best students from other graduate programmes such as law and public policy.

In an attempt to lure new students, leading business schools - including Harvard, Stanford, the University of Chicago and Wharton - have moved away from the unofficial admissions prerequisite of four years' work experience and instead have set their sights on recent college graduates and so-called "early career" professionals with only a couple years of work under their belt.

2 READING: FILL IN THE BLANKS

2.1 WOLF STORY

From the wolves' perspective, this is clearly good news. But it also had beneficial effects on the ecology of the park, according to a study published in 2004 by William Ripple and Robert Beschta from Oregon State University. In their paper in BioScience, the two researchers showed that reintroducing the wolves was correlated with increased growth of willow and cottonwood in the park. Why? Because grazing animals such as elk were avoiding sites from which they couldn't easily escape, the scientists claimed. And as the woody plants and trees grew taller and thicker, beaver colonies expanded.

Of course, not every wolf story is positive. National Public Radio in the US reported last July that a nine-year-old programme to reintroduce the endangered Mexican grey wolf in the southwestern US was struggling because some wolves weren't learning to hunt in the wild and because others were simply being shot. Perhaps the shotgun response of locals in the mountains of Arizona and New Mexico was unsurprising, for the wolves had been preying on livestock. The reintroduction area is apparently grazing land.

2.2 PINK ONIONS

The most vital ingredient in Indian cooking, the basic element with which all dishes begin and, normally, the cheapest vegetable available, the pink onion is an essential item in the shopping basket of families of all classes.

A popular saying holds that you will never starve because you can always afford a roti (a piece of simple, flat bread) and an onion.

But in recent weeks, the onion has started to seem an unaffordable luxury for India's poor. Over the past few days, another sharp surge in prices has begun to unsettle the influential urban middle classes.

The sudden spike in prices has been caused by large exports to neighboring countries and a shortage of supply. But the increase follows a trend of rising consumer prices across the board — from diesel fuel to cement, from milk to lentils.

2.3 THE FABRIC OF THE COSMOS

Surely, reality is what we think it is; reality is revealed to us by our experiences.

To one extent or another, this view of reality is one many of us hold, if only implicitly. I certainly find myself thinking this way in day-to-day life; it's easy to be seduced by the face nature reveals directly to our senses. Yet, in the decades since first encountering Camus' text, I've learned that modern science tells a very different story. The overarching lesson that has emerged from scientific inquiry over the last century is that human experience is often a misleading guide to the true nature of reality.

2.4 Exploring the Deep Ocean Floor

The ocean floor is home to many unique communities of plants and animals. Most of these marine ecosystems are near the water surface, such as the Great Barrier Reef, a 2,000-km-long coral formation off the northeastern coast of Australia. Coral reefs, like nearly all complex living communities, depend on solar energy for growth (photosynthesis). The sun's energy, however, penetrates at most only about 300 m below the surface of the water. The relatively shallow penetration of solar energy and the sinking of cold, subpolar water combine to make most of the deep ocean floor a frigid environment with few life forms.

In 1977, scientists discovered hot springs at a depth of 2.5 km, on the Galapagos Rift (spreading ridge) off the coast of Ecuador. This exciting discovery was not really a surprise. Since the early 1970s, scientists had predicted that hot springs (geothermal vents) should be found at the active spreading centers along the mid-oceanic ridges, where magma, at temperatures over 1,000 °C, presumably was being erupted to form new oceanic crust. More exciting, because it was totally unexpected, was the discovery of abundant and unusual sea life -- giant tube worms, huge clams, and mussels -- that thrived around the hot springs.

Incorrect Options

Unexpected / Disaster / Aggregation / Natural / Frigid / Surprise / Grow / Warm / Formation / Thrived / Surprise

2.5 Training Medical Managers

In the fast-changing world of modern healthcare, the job of a doctor is more and more like the job of chief executive. The people who run hospitals and physicians' practices don't just need to know medicine. They must also be able to balance budgets, motivate a large and diverse staff and make difficult marketing and legal decisions.

"The focus in medical school is to train good doctors, but part of being a good doctor is being a good manager," says Fawaz Siddiqi, a neurosurgical resident at the London Health Sciences Centre in Canada. "It's having a core understanding of how to work within the context of an organisation."

The desire to be a "good manager" is precisely the reason Dr Siddiqi, who aspires one day to run a hospital, decided to go back to school. This past autumn he enrolled in a health-sector MBA programme at the Ivey School of Business at the University of Western Ontario.

2.6 Online Campus

Richard Morris, of the school of accounting at the University of NSW, which requires an entrance score in the top 5 per cent of students, says attendance has been a problem since the late 1990s.

"Sometimes in the lectures we've only got about one- third of students enrolled attending," he said.

"It definitely is a problem. If you don't turn up to class you're missing out on the whole richness of the experience: you don't think a whole lot, you don't engage in debates with other students - or with your teachers."

It is not all gloom, said Professor John Dearn, a Pro Vice-Chancellor at the University of Canberra, who said the internet was transforming the way students access and use information.

"It is strange that despite all the evidence as to their ineffectiveness, traditional lectures seem to persist in our universities."

2.7 Does space travel damage eyesight?

Researchers already know that spending long periods of time in a zero-gravity environment — such as that inside the International Space Station (ISS) — results in loss of bone density and damage to the body's muscles. That's partly why stays aboard the ISS are capped at six months. And now, a number of NASA astronauts are reporting that their vision faded after spending time in space, with many needing glasses once they returned to Earth.

2.8 The Writing on the Wall

The inevitable consequences include rampant corruption, an absence of globally competitive Chinese companies, chronic waste of resources, rampant environmental degradation and soaring inequality. Above all, the monopoly over power of an ideologically bankrupt communist party is inconsistent with the pluralism of opinion, security of property and vibrant competition on which a dynamic economy depends. As a result, Chinese development remains parasitic on know-how and institutions developed elsewhere.

2.9 Arabic MBA in Edinburgh

Arab students will be able to sign up to study at a distance for the business courses in their own language. The Edinburgh Business School announced the project at a reception in Cairo on Saturday. It is hoped the course will improve links between the university and the Arab business world. A university spokeswoman said: "The Arabic MBA will raise the profile of Heriot-Watt University and the Edinburgh Business School among businesses in the Arabic-speaking world and will create a strong network of graduates in the region." The first intake of students is expected later this year. Professor Keith Lumsden, director of Edinburgh Business School, said: "Arabic is a major global language and the Arab world is a centre for business and industrial development. We are proud to work with Arab International Education to meet the demands of the region."

2.10 Jean Piaget

Jean Piaget, the pioneering Swiss philosopher and psychologist, spent much of his professional life listening to children, watching children and poring over reports of researchers around the world who were doing the same. He found, to put it most succinctly, that children don't think like grownups. After thousands of interactions with young people often barely old enough to talk, Piaget began to suspect that behind their cute and seemingly illogical utterances were thought processes that had their own kind of order and their own special logic. Einstein called it a discovery "so simple that only a genius could have thought of it."

Piaget's insight opened a new window into the inner workings of the mind. By the end of a wide-ranging and remarkably prolific research career that spanned nearly 75 years, from his first scientific publication at age 10 to work still in progress when he died at 84, Piaget had developed several new fields of science: developmental psychology, cognitive theory and what came to be called genetic epistemology. Although not an educational reformer, he championed a way of thinking about children that provided the foundation for today's education-reform movements. It was a shift comparable to the displacement of stories of "noble savages" and "cannibals" by modern anthropology. One might say that Piaget was the first to take children's thinking seriously.

2.11 DNA Barcoding

DNA barcoding was invented by Paul Hebert of the University of Guelph, in Ontario, Canada, in 2003. His idea was to generate a unique identification tag for each species based on a short stretch of DNA. Separating species would then be a simple task of sequencing this tiny bit of DNA. Dr Hebert proposed part of a gene called cytochrome c oxidase I (COI) as suitable to the task. All animals have it. It seems to vary enough, but not too much, to act as a reliable marker. And it is easily extracted,

because it is one of a handful of genes found outside the cell nucleus, in structures called mitochondria.

The idea worked, and it has dramatically reduced the time (to less than an hour) and expense (to less than $2) of using DNA to identify species. And thus, in July this year, Dr Victor's mystery goby became Coryphopterus kuna. It was the first vertebrate to have its DNA barcode—a sequence of about 600 genetic “letters”—included in its official description.

Barcoding has taken off rapidly since Dr Hebert invented it. When the idea was proposed, it was expected to be a boon to taxonomists trying to name the world's millions of species. It has, however, proved to have a far wider range of uses than the merely academic—most promisingly in the realm of public health.

One health-related project is the Mosquito Barcoding Initiative being run by Yvonne-Marie Linton of the Natural History Museum in London. This aims to barcode 80% of the world's mosquitoes within the next two years, to help control mosquito-borne diseases. Mosquitoes are responsible for half a billion malarial infections and 1m deaths every year. They also transmit devastating diseases such as yellow fever, West Nile fever and dengue. However, efforts to control them are consistently undermined by the difficulty and expense of identifying mosquitoes—of which there are at least 3,500 species, many of them hard to tell apart.

2.12 Assessment in Design and Technology

Professor Richard Kimbell directed the DES funded Assessment of Performance Unit research project in Design and Technology. In 1990 he founded the Technology Education Research Unit (TERU) at Goldsmiths College, University of London, which is now running a wide range of funded research projects in design and technology and IT. He has published widely in the field, including reports commissioned by the Congress of the United States, UNESCO and NATO; he has written and presented television programmes and regularly lectures internationally. His latest book Assessing Technology: International Trends in Curriculum and Assessment won the international technology education book of the year award from the Council for Technology Teacher Education at ITEA in 1999 in Minneapolis, USA.

Kay Stables is Reader in Design and Technology Education and former Head of the Design Department at Goldsmiths College, University of London. She started her career as a textiles teacher, moving to Goldsmiths as a part of the APU D&T research team. From 1990–1992 she was Project Director for the Key Stage 1 Technology SAT developments and followed this as Research Associate on the Understanding Technological Approaches project which built case studies of D&T work from children aged 5–16. Most recently she has conducted, with Richard Kimbell, an evaluation of the impact of a technology education initiative in South Africa and is currently researching into the use of handling collections in developing D&T capability and literacy.

2.13 Origin of Vaccination

According to the literature, the history of vaccination can be traced back to as early as the 7th century when the monks in India tried to immunize themselves by drinking snake venom. The first vaccination was inoculation with human smallpox, a practice widely carried out in ancient India, Arabia, and China. This method of vaccination consisted of collecting pus from a patient suffering from mild form of smallpox virus infection and inoculating the sample to a healthy human, which later led to a minor infection.

This method was first introduced in England by a Greek named E. Timoni. However, this method had a risk of spreading smallpox in the community and even worsening the health condition of the person who received the inoculation.

While the use of human smallpox vaccine was controversial, E. Jenner came up with bovine smallpox vaccine in 1796; this new method also faced controversy, but continued to be universalized. Smallpox became a preventable disease by injecting pus extracted from a human infected with cowpox virus. Jenner named the substance "vaccine" after the Latin word "vacca" which means "cow," and thus the process of giving vaccine became "vaccination".

2.14 Mud Volcano

Gas drilling on the Indonesian island of Java has triggered a "mud volcano" that has killed 13 people and may render four square miles (ten square kilometers) of countryside uninhabitable for years.

In a report released on January 23, a team of British researchers says the deadly upwelling began when an exploratory gas well punched through a layer of rock 9,300 feet (2,800 meters) below the surface, allowing hot, high-pressure water to escape.

The water carried mud to the surface, where it has spread across a region 2.5 miles (4 kilometers) in diameter in the eight months since the eruption began.

The mud volcano is similar to a gusher or blowout, which occur in oil drilling when oil or gas squirt to the surface, the team says. This upwelling, however, spews out a volume of mud equivalent to a dozen Olympic swimming pools each day.

Although the eruption isn't as violent as a conventional volcano, more than a dozen people died when a natural gas pipeline ruptured.

The research team, who published their findings in the February issue of GSA Today, also estimate that the volcano, called Lusi, will leave more than 11,000 people permanently displaced.

2.15 STRESS

Stress is what you feel when you have to handle more than you are used to. When you are stressed, your body responds as though you are in danger. It makes hormones that speed up your heart, make you breathe faster, and give you a burst of energy. This is called the fight-or-flight stress response.

Some stress is normal and even useful. Stress can help if you need to work hard or react quickly. For example, it can help you win a race or finish an important job on time.

But if stress happens too often or lasts too long, it can have bad effects. It can be linked to headaches, an upset stomach, back pain, and trouble sleeping. It can weaken your immune system, making it harder to fight off disease. If you already have a health problem, stress may make it worse. It can make you moody, tense, or depressed. Your relationships may suffer, and you may not do well at work or school.

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